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THE CASTLE OF CHILLON.

CASTLE OF CHILLON.

There are seven pillars of Gothic mould
In Chillon's dungeons deep and old,
There are seven columns, massy and gray,
Dim with a dull imprisoned ray,—
A sunbeam which hath lost its way,
And through the crevice and the cleft
Of the thick wall is fallen and left;
Creeping o'er the floor so damp,
Like a marsh's meteor-lamp.

The associations connected with Switzerland are calculated to excite considerable emotion. Its enchanting scenery, picturesque valleys, and lofty mountains, forming, perhaps, the only country in Europe whose inhabitants have preserved the simplicity of patriarchal manners,—the historical dramas which have been acted on this wild and beautiful scene, which has also supplied the poet and the artist with the subjects of their choicest productions,—all this has contributed to render Switzerland the most remarkable country in Europe.

But no part of this romantic land is richer in natural and mental associations than the Lake of Geneva, whether considered with reference to the picturesque, or the historical, or the number of distinguished individuals, who have dwelt upon its banks, and have celebrated almost every tree, every rock, and every little isle. Would that we could add that most of these writers, attracted, as they were, to this spot by the beauties of nature, had devoted their high powers for their Creator's glory and for the benefit of mankind at large; instead of profaning nature's sanctuary by mistaking nature for nature's God.

On the north-eastern bank of the Lake of Geneva, near the mouths of the rapid Rhone, is situate the castle of Chillon, between Clarens and Villeneuve: and about a mile and a half from the former, opposite the castle on the south, are the beautiful heights of Meillerie, which shut out the view of the Savoy Alps.

At this spot the lake is seven miles wide, and very deep. The castle is built on a flat rock near the shore, and connected therewith by a wooden bridge. "Chillon," says a recent tourist, "which is long, white, and, till closely approached, more like a modern than an ancient building, is backed by mountains covered with verdure."

The castle of Chillon, or rather the castellated house, (says Coxe,) is a large pile with round and square towers, standing on a rock in the lake, and connected with the land by a draw-bridge. The vaults are very fine; the arched roof, and the pillars which support it, are in a neat Gothic style. This castle, in 1536*, was wrested from Charles the

* The castle of Chillon was seized by the insurgents in January, 1798, and this act of rebellion not being punished, was followed by the separation of the Pays de Vaud from the Canton of Bern.

Third of Savoy by the Canton of Bern, assisted by the Genevans, who furnished a frigate (their naval force) to besiege it by water. In a deep dungeon below the level of the lake, the conquerors found Bonivard, prior of St. Victor, the intrepid antagonist of the dukes of Savoy, and the great assertor of Genevan independence. He had been imprisoned by the Savoyards during six years, and by constant walking in his short limits, had worn a hollow in the rock. This castle was for a short time the residence of a bailiff from Bern, until a more convenient house was purchased in Vevay.

Across one of the vaults of the castle is a beam, black with age, on which condemned prisoners are said formerly to have been hung. In the dungeons are seven pillars, in some of which are rings for securing the fetters of the captives. In 1817 M. Simond visited the castle and the far-famed dungeon, which had so long been reported to be considerably below the level of the lake. On comparing the height of the loop-hole gratings above the water's edge from the outside, and above the rocky floor inside, he satisfied himself that the latter was more elevated than the former; especially after having observed a hollow place full of water, which must have come from the lake, and would have risen above the floor of the dungeon, if it had really been lower than the level of the water outside. He adds ironically,—

It grieves me to contradict poets, or picturesque and sentimental tourists, but really the dungeon of Chillon is not under water; and, moreover, it is positively a comfortable enough sort of dungeon, full forty feet long, fifteen or twenty feet wide, and fifteen feet high, with several narrow openings in the thick wall, above reach it is true, but admitting air and light, and even some rays of sunshine.

Mr. John Scott visited Chillon in 1819. It was on a Sunday, and he prettily remarks,—

While I was regarding a beautiful cottage below the church, and a small terrace garden,—small enough to be happy,—a spot hid from the storms of life,—the sound of psalm-singing broke out from the church. I afterwards heard bells, coming down the Alpine glens.

The arms of the Pays de Vaud are painted like a playing card upon the walls of the Château of Chillon. The Swiss soldiers have a flat and bourgeois air; they are somewhat midway between feudals and train-bands; their costume is like that of the knave of clubs. The view, looking back from the end of the lake at Villeneuve, is fine; the castle is interesting from its idle uselessness; the times are gone when it was of service.

In order to understand the last allusion, it must be stated that the castle was a state prison at the time of the Reformation, and a sort of bastile during the French Revolution.

The manufacturers of the nests, so greatly in esteem in China, are small swallows, which are supposed to collect the glutinous substance of which they are composed from the sea. The nests resemble small tea-saucers in form, the rim being about the size of that of a tumbler. The best, that is, those collected before the eggs of the bird have been laid, are of a light red colour, and nearly transparent, bearing almost a perfect resemblance to isinglass, except that they are rather more brittle. China is almost the only market for this delicacy, the nests being greatly in demand throughout the Celestial Empire, in consequence of their supposed nutritious qualities. They are of three different degrees of excellence, and the best kind is sold in China at the rate of nine shillings an ounce. When used for culinary purposes, they are dissolved in water, and made into a tasteless soup. I have eaten them several times, at the tables of rich Chinese, but must confess that they did not strike me as being at all agreeable to the palate: in fact, it is difficult to distinguish the slightest flavour. The collection of these nests is a work of danger and difficulty; they are taken periodically, and it is necessary to station proper persons at the mouths of the caverns, to prevent the birds from being disturbed by intruders.—Earl's *Voyages*.

ELECTRICITY.

No. X.

EFFECTS OF ACCUMULATED ELECTRICITY.

In all cases of electrical excitation, there is a tendency in the disturbed elements to return to their former state of repose. This struggle, for such it may not improperly be termed, to recover its equilibrium, being greater in proportion as the intensity of the accumulated charge is increased.

Let it be remembered that the *tension*, or *intensity*, of electricity, affords only a relative and very imperfect indication of *quantity*; the former terms being understood as referring to the electrical states of bodies, and to the energy exhibited by the redundant electricity contained in them, to make its escape.

For example: if we fix a *quadrant electrometer** on the conductor, a very gentle motion of the machine, amounting scarcely to one revolution, will cause the index of the instrument to move from a vertical to a horizontal position; showing that the electricity accumulated in the conductor has attained its maximum tension. The motion of the machine being continued, so as to keep the index steady at 90°, let the knob of a small Leyden jar be placed near the conductor, say within about half an inch. As soon as a spark passes from the latter to the former, the index will fall; which denotes that by diffusing the electricity contained in the conductor over a greater surface, that is over the coated portion of the jar, its tension is suddenly reduced. Still continuing to work the machine, and noting the number of revolutions, we shall find that when a few sparks have entered the jar, the electrometer will be again affected; as the charge accumulates, the index gradually rising, until it points, as in the former instance, at 90°. Removing the small jar, suppose we substitute for it one considerably larger, and proceeding, as already described, we shall find, that instead of three or four revolutions of the machine, which suffice to produce the maximum tension in the small jar, the larger one will require perhaps eight or ten times as many to produce a corresponding result.

Hence we remark that the quadrant electrometer is not intended to give any indication of the actual quantity of electricity present in various bodies; but its chief utility consists in its enabling the operator to detect any error in his arrangements, or defect in the apparatus; whilst in connexion with Leyden jars, whose capacities for retaining a charge are previously ascertained, this instrument can be made to supply the place of those of a more expensive character.

Nor must we fail to mention, that although it may be sometimes necessary to note the number of revolutions made by the machine, yet they afford only a vague means of estimating the quantity of electricity produced by its agency. From various causes a machine will be more active at one time than another; and even when all other circumstances are equal, a skilful manipulist will in ten minutes bring into action a greater quantity of electricity than can be produced from the same machine by an inexperienced operator in an hour.

The electricity accumulated in a Leyden jar, or other non-conducting, or insulated body, having reached its maximum tension, whatever may be afterwards communicated to it is instantly dissipated, entering into such bodies as may be near, or if there be none within striking distance, then, as most commonly happens, the redundant electricity diffuses itself into the surrounding air. This will be better understood by charging a jar in the dark; for, as soon

* See *Saturday Magazine*, Vol. XIII., p. 229.

as a certain quantity of electricity has entered it, there will be seen issuing from the edges of the jar, and those of the tin-foil coating, streams of pale blue light, accompanied by a hissing sound.

The state of the atmosphere, as affecting electrical experiments, has already been mentioned. We may here further remark that it is impossible to operate with any certainty of success, with accumulated electricity, unless the jars containing it are quite clean, and free from moisture; and, as one means of ensuring the latter condition, we must take care that the temperature of the jars is not lower than that of the air in the room. It rarely happens that very accurate electrical investigations can be conducted in a room where a great number of persons is assembled. The temperature may be sufficiently high; but the successful illustration of electrical phenomena depends less upon temperature than upon the quantity of vapour present. The higher the temperature of the air, the greater the quantity of vapour it is capable of containing; and as the sources of vapour, under the circumstances just mentioned, are abundant, we may perceive why a crowded room is unfavourable to the objects of which we are treating.

There is a limit to the quantity of electricity which a Leyden jar can be made to contain; depending partly on the form, structure, and arrangement of the several parts of the jar itself, and partly on external circumstances, as for instance the state of the surrounding air, and the situation of the jar, with respect to other bodies.

Let a jar, with a quadrant electrometer attached to it, be connected with the conductor, and charged in the usual way, until the index rises to 60°. If it be then detached from the machine, the jar, supposing it to be well arranged, quite clean and dry, and the surrounding air in a favourable state, will retain the greater part of the electricity accumulated in it for several minutes, and perhaps hours; but the action of the electrometer will show that some part is escaping. Let the same jar be now wiped just above the coating with a damp cloth, or it may be placed near an open window or door: then if we attempt to charge it, we shall find it a difficult matter to raise the index of the electrometer to the same point as before; and if we do, it will continue there only so long as we maintain the action of the machine.

But when everything is favourable, and the arrangements as perfect as they can be made, a jar will contain only a certain quantity of electricity; and, if we attempt to force more into it, we occasion what is termed a *spontaneous discharge;* which means that the electricity has forced for itself a passage over the uncoated parts, and around the edges of the jar; or, as sometimes happens, that it has passed through the substance of the glass. In the latter case, the glass being perforated, although the fracture may be so small as only with difficulty to be detected, the jar is thereby rendered useless. Hence it is important to guard against these spontaneous discharges; for if the jar be not broken by the concussion, we have noticed that when thus acted upon many times, its power of retaining a charge is very much lessened. The tendency to discharge spontaneously is greater in jars fitted up with covers, and especially when the covers are fixed, than when the mouth of the jar is left open. This is one reason why we prefer to any other the arrangement described in our last paper.

It was shown, when speaking of induced electricity, that the effect of electrical excitation, produced on one side of a plate of glass, was instantly apparent on the opposite side; induction taking place through the substance of the glass itself. It may hence be reasonably inferred that the thinner the glass of which a Leyden jar is made, the more promptly will it receive a charge. The fact is so; but still it is not advisable that the glass should be very thin; for in proportion that its readiness in receiving a charge is thereby increased, so is its power of retaining it diminished. For all practical purposes the jars commonly used by druggists and confectioners are found the most useful; those of a moderate and uniform thickness, and without irregularities of surface, being always selected.

A Leyden jar which has just been discharged will be found a few minutes afterwards still to contain a small quantity of electricity, as will be indicated by its yielding a faint spark. This is called the *residual* charge; and consists of that portion of electricity which penetrates beneath the surface of the glass, and of that, which in its endeavour to escape, spreads itself around and beyond the edges of the coating. When the first discharge takes place, the electricity occupying the situations just named, is too distant from the coating to make its escape suddenly; but the pressure from behind it being removed, it slowly returns from its state of isolation and entanglement, and diffusing itself over the coated surface of the jar, may be dislodged by a second discharge, as already mentioned.

This residual charge is greater in proportion to the tension of the accumulated electricity. It is greater from some jars than others; and when a jar spontaneously discharges itself, than when discharged in the ordinary way. As it is in most cases sufficiently powerful to occasion a very disagreeable shock, the careful experimentalist will test every recently discharged jar before he again uses it.

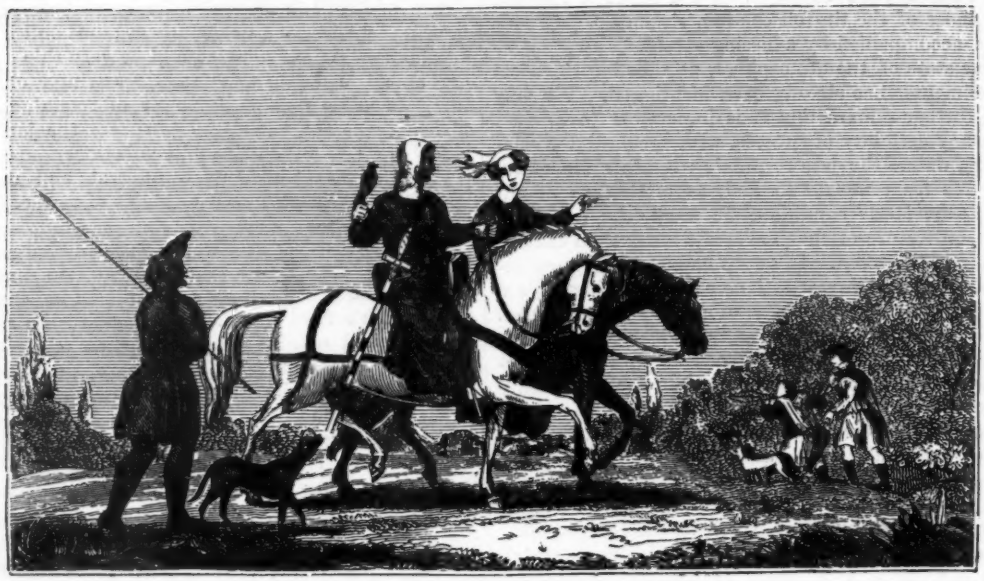
When large quantities of electricity are required, any number of jars may be combined in such a way that they can all be charged and discharged in the same manner as a single jar. This arrangement is termed an *electrical battery.* The interior coatings of all the jars in the series, must be in metallic communication with each other; the most convenient method of accomplishing which is by a frame-work of brass rods, the angular portions terminating in balls. To facilitate the removal of the jars from place to place, they may be fitted into a box having separate compartments for the reception of each jar. It is also desirable that provision be made for removing and replacing any of the jars without deranging those that remain. The exterior coatings of the whole series must also communicate. This can be effected by covering the bottom of the box with tin-foil; and then the battery may be discharged, by means of some fixed object in contact with the foil, as a hook or ball for instance, which thus becomes common to each jar.

The caution already given to prevent if possible the spontaneous discharge of a single jar is still more necessary in the management of a combined series; the most trifling defect in any one jar rendering useless the whole battery, until the fractured jar has been removed.

THE respect for, and the study of, the works of creation, tend to make us wiser and happier, and lead us to the contemplation of the omniscient Dispenser of the objects we admire.—MAUND.

THE region of passion is a land of despotism, where reason exercises but a mock jurisdiction, and is continually forced to submit to an arbitrary tyrant, who, rejecting her fixed and temperate laws, is guided only by the dangerous impulse of his own violent and uncontrollable wishes.—?

ENGLAND IN THE OLDEN TIME. No. VI.



HAWKING IN THE THIRTEENTH CENTURY.

Hawking, or Falconry.

One of the most esteemed pastimes of the English gentry in bygone times, was *Hawking*, or *Falconry*, which are synonymous terms. Persons of high rank rarely appeared without their dogs and their hawks when abroad: they even took their hawks with them when they went to battle. A writer of the fifteenth century complains in rhyme of the custom of bringing hawks and other sporting animals into churches:—

> Into the church then comes another sotte,
> Withouten devotion, jetting up and down,
> Or to be seene, and showe his garded cote.
> Another on his fiste a sparhawke or fawcone,
> Or else a cokow; wasting so his shone;
> Before the aulter he to and fro doth wander,
> With even as great devotion as doth a gander.
> In comes another, his houndes at his tayle,
> With lines and leashes, and other like baggage;
> His dogges barke, so that withouten fayle,
> The whole church is troubled by their outrage.

As to the question when hawking had its origin, no certainty exists, for there are many passages in early writers which seems to indicate the prevalence of a custom something like this. The principle which distinguishes it is this; to hunt down and capture some species of birds by means of trained birds of another species. In India, in former times, kites were trained to catch animals of various kinds. To train these kites, the Indians let loose a tame hare or fox, with a piece of flesh fastened to it, and suffered the birds to fly after it, in order to seize the flesh, of which they are fond, and which, on their return, they received as the reward of their labour. When thus instructed to pursue their prey, they were sent after wild foxes and hares in the mountains; these they followed in hopes of obtaining their usual food, and soon catch them and bring them back to their masters.

The training of a hawk is a remarkable exercise of perseverance, in overcoming the natural habits of the bird. They are sometimes taken from the nest, and at other times are captured in a grown-up state, and then disciplined. The objects which the falconer has in view are,—to accustom the bird to settle on his fist, to spring when he throws him off, to know the voice, the singing, the whistling, or any other signal from the falconer, and to return when called. At first they are tied with a string about thirty fathoms in length, to prevent them from flying away; from which they are not released till they are completely disciplined, and return at the proper call or signal. For this purpose they must be *lured*. The lure is a piece of red stuff or wool, on which are fixed a bill, talons, and wings. To this is likewise fastened a piece of that flesh on which the bird feeds, and the lure is thrown out to him. When they intend to reclaim or recall him, the sight of food brings him back; and in time the voice will be sufficient. The various plumage with which the lure is decked is called a "Drawer." When they accustom the hawk to fly at a kite, a heron, or a partridge, they change the "drawer" according to the kind of game to which he is to be devoted. When this is a kite, they fix the bill and feathers of that bird to the lure; and so of the rest: and in order to entice the bird to his object, they fasten beneath the drawer or plumage the flesh of a chicken or other fowl, occasionally seasoned with sugar and spices, together with marrow and other delicacies. Thus he is prepared for springing at real game. Having been accustomed to a month's exercise in a room or garden, the bird is then tried in the open field, with little bells fastened to his feet, in order to give information of his motions. He is always capped or hooded, that he may see no object but his game; and as soon as the dogs either stop or spring the game, the falconer unhoods the bird, and tosses him into the air after his prey. His various motions in the air furnish much diversion. At length he descends, and launches upon his prey with the rapidity of an arrow; and bears it to his master, who recalls him. On these first essays he is presented with the neck and other parts of the bird, as a reward. These gratuities, and the caresses of the falconer, animate the bird to the performance of his duty, and prevent him from "bearing away his bells," that is, from flying off and not returning.

The principal means by which the falconer gains the ascendency over the hawk, is by appealing to his appetite. This is managed in a hundred ways, to lead the bird by indirect means to obey the falconer. Sometimes the bird is kept almost without food for

several days, in order to break his spirit and reduce him to obedience.

We have said that the hawk is in some cases taken from the nest, and at others is caught when well-grown. The mode of catching them is remarkable. If a falcon is pursuing his flight through the air, he will not descend to an immoveable and lifeless bait on the ground. For this reason the experienced falconer fixes in the centre of his net a pulley, or a strong iron wire bent with a ring, through which he passes a string sixty or eighty feet long; and at its extremity ties by its legs a live pigeon; and as the falcon sometimes flies so high as not to be seen, the sportsman is informed of his motions by means of a butcher-bird, which is fastened by a string, tied to a stick, near the neck. By its movements this bird indicates the kind of hawk which is hovering above; if it be a buzzard, or any kind of sluggish hawk, the butcher-bird's motions are but slight; but if it suddenly flies down and hides itself, it is a sign that some large falcon is above; and the falconer then lets out the pigeon, whose apparent state of liberty attracts the sight of the falcon. If approached readily, the man withdraws the pigeon, and after a short interval, lets it out again: the second appearance of the pigeon always invites the falcon, which darts upon it as its prey, and is consequently caught in the net, which the man instantly draws over it.

Kings, knights, ladies, and all the most important personages in the land, were fond of the pastime of hawking: indeed, there is no out-door amusement in which ladies joined to so great an extent as hawking. They not only accompanied gentlemen in the sport, but often practised it by themselves. Hawking was forbidden to the clergy by the canons of the church; but the prohibition was by no means sufficient to restrain them from the pursuit of this favourite and fashionable amusement. Edward the Third, according to Froissart, had with him in his army when he invaded France, thirty falconers on horseback, who had charge of his hawks, and every day he either hunted or hawked, as his fancy led him. An anonymous writer, of the seventeenth century, states the following anecdote:

Sir Thomas Jermin, going out with his servants and brooke hawks one evening at Bury, they were no sooner abroad, but fowle were found, and he called out to one of his falconers, "Off with your jerkin." The fellow being into the wind (to the windward) did not heare him; at which he stormed, and still cried out "Off with your jerkin, ye knave, off with your jerkin:" now it fell out that there was at that instant a plaine townsman of Bury, in a freeze jerkin, stood betwixt him and his falconer, and who seeing Sir Thomas in such a rage, and thinking that he had spoken to him, unbuttoned himself amaine, threw off his jerkin, and besought his worshippe not to be offended, for he would off with his doublet too, to give him content.

The manner in which hawking was indulged in was either on horseback or on foot, as occasion required. On horseback, when in the open fields or open country, as represented in our cut, and on foot when in woods and coverts. In following the hawk on foot, it was usual for the sportsman to have a stout pole with him, to assist him in leaping over little rivulets and ditches, which might otherwise retard his progress; and this we learn from an historical fact related by Hall. Henry the Eighth, pursuing his hawk on foot, at Hitchin, in Hertfordshire, attempted, with the assistance of his pole, to jump over a ditch that was half full of muddy water. The pole broke, and the king fell with his head into the mud, where he would have been stifled, had not a footman, who was near at hand, leaped into the ditch, and released his majesty from his perilous situation.

When the hawk was not flying at her game, she was usually covered with the hood or cap provided for that purpose and fitted to her head; and this hood was worn abroad as well as at home. All hawks taken upon "the fist," the term used for carrying them upon the hand, had straps of leather, called *jessies*, put about their legs. The jessies were made sufficiently long for the knots to appear between the middle and the little fingers of the hand that held them, so that the lunes, or small thongs of leather, might be fastened to them with small tyrrets or rings, and the lunes were closely wound round the little finger. Lastly, their legs were adorned with bells, fastened with rings of leather, each leg having one; and the leathers to which the bells were attached were denominated *bewits;* and to the bewits was added the *creance,* or long thread, by which the bird, in tutoring, was drawn back, after she had been permitted to fly, and this was called "the reclaiming of the hawk." The person who was exercising the diversion of hawking, had a glove on the hand, to protect it from the talons of the bird.

It will be understood then that in the pastime of hawking or falconry, a hawk was held on the hand (whether the sportsman were on horse or on foot), and that its head was hooded. When the dogs which accompanied them gave notice of the proximity of partridges, pheasants, or some similar bird, the hood was instantly taken off the hawk, he was made to see his prey, and then set loose. He immediately started in pursuit, killed his victim, and returned to the hand of his master or mistress. This was the task allotted to the hawk; and it may well be supposed that constant and severe training was necessary, to bring it to that degree of obedience.

In France there was an officer called the "Grand Falconer," who was a person of much importance: his annual salary was four thousand florins: he was attended by fifty gentlemen, and fifty assistant falconers. He was allowed to keep three hundred hawks: he licenced every vender of hawks in the kingdom, and received a tax upon every bird sold in the kingdom, even within the verge of the court itself, and the king never rode out upon any occasion of consequence, without this officer attending upon him.

Birds, which ministered so much to the amusement of the titled and wealthy, were naturally valued at a high price, and particular laws enacted for their preservation. In Henry the Seventh's reign it was enacted that if any one should take the eggs out of a hawk or falcon's nest, he should suffer imprisonment for one year and a day, and be liable to a fine at the king's pleasure; one half of which belonged to the crown, and the other half to the owner of the ground whereon the eggs were found; and if a man destroyed the eggs upon his own ground, he was equally subject to the penalty. At the commencement of the seventeenth century, a gos-hawk and a tassel-hawk were sold for one hundred marks, a large sum in those days, but which was not considered too large for a bird whose rearing required such extraordinary care, time, and trouble, as that of the hawk. It was considered by no means a mean present from one sovereign to another. In the eighth year of the reign of Edward the Third, the king of Scotland sent him a falcon as a present, which he not only most graciously received, but rewarded the falconer who brought it with a donation of forty shillings—a proof how highly the bird was valued.

Hawking is altogether a relic of times long gone by. Nothing of the kind is now known in England. It flourished for many centuries, and was perhaps never

in greater favour than in the beginning of the seventeenth century; but by the end of the same century it was rarely practised. It was regarded quite in the light of a science. Treatises were written in English, Latin, French, Italian, and other languages, descanting fully on the whole art and mystery of training and using hawks. There is one called "The Booke of Falconrie or Hawking; for the onely delight and pleasure of all Noblemen and Gentlemen," written by George Tuberville, about 250 years ago. He gives a quaint "copy of verses," in favour of hawking, from which a short extract must close our paper.

I deeme that no Man doubts but games and all our chiefe delightes,
Were first deuised to daunt the dumps of pensive pained sprites,
To clear the clowds of drowping cares and mists of mournfull mind,
And banish all that heauie harts in cheerelesse chaines did bind.
If games were thus found out at first, for mind and bodies ease,
As well to quit that one of griefes as th' other of disease;
Why then? of force it follow must, that those delightes are chiefe,
And most to be imbrast, that lend to either parte reliefe.
Which if be so I need not blush, or deeme it my disgrace,
If Hawks and Spanels I preferre, and set in highest place.
For truely no deuise delights, the mind of man so much,
No game so gladsome to the limmes, there is no pleasure such!
No Phisicke fitter to remoouo the dregs of direfull paine,
And to restore to former life, the feeble force againe!

Death of Cowper.—The poet's death had been so placid and tranquil, that not one of the five persons who surrounded his bed was conscious of the termination of his mortal existence; and the expression of calmness and composure, mingled, as it were, with the "holy surprise," which settled on his countenance, might have delighted his friends with the assurance that the shadow had been swept from his closing eyes: and that One had shone over his pillow, whose salutation was Peace! His epitaph may be found in the beautiful verse of a spirit related to his own in gentleness and truth, upon whom the "mild rays of Paradise" have also broken.

Thou art gone to the grave; and earth's mansions forsaking,
Perchance thy weak spirit in fear lingered long;
But the mild rays of Paradise beamed on thy waking,
And the sound which thou heard'st was the seraphim's song.
Heber.

Willmott's *Lives of Sacred Poets.*

In the parish of St. Olave, Tooley Street, Borough, the church-yard is detached from the church, and surrounded with high buildings, so as to be wholly inaccessible but by one large close gate. "A poor tailor of this parish dying," (says Mr. Blaine, in his *Canine Pathology*,) "left a small cur dog inconsolable for his loss. The little animal would not leave his dead master even for food: and whatever he ate, was obliged to be placed in the same room with the corpse. When the body was removed for burial, this faithful attendant followed the coffin. After the funeral, he was hunted out of the church-yard by the sexton. The next day he again found the animal, who had made his way, by some unaccountable means, into the enclosure, and had dug himself a bed on the grave of his master. Once more he was hunted out: and again he was found in the same situation the following day. The minister of the parish, hearing of the circumstance, had him caught, taken home and fed, and endeavoured by every means to win the animal's affections; but they were inseparably wedded to his late master, and he took the first opportunity to escape, and regain his lonely situation. With true benevolence, the worthy clergyman permitted him to follow the bent of his inclinations; but to soften the rigour of his fate, he built him a small kennel upon the grave, which was replenished once a day with food and water. Two years after did this mirror of fidelity pass in this manner, till death put an end to his griefs."

The mind of a child is not like that of a grown person, too full and too noisy to observe everything: it is a vessel always ready to receive, and always receiving.—Mrs. Child.

THE EVENING PRIMROSE. (*Œnothera biennis.*)

You, Evening Primroses, when day has fled,
Open your pallid flowers, by dews and moonlight fed.—Barton.

This North American flower was first sent from Virginia to Padua, in the year 1619, but at what exact period it reached England is uncertain, since Parkinson is the earliest author who notices it; but it must have been some time previous to 1629, as in his "Garden of Pleasant Flowers," which was published in that year, he speaks of it in a more familiar style than he would have done had it been of late introduction. This author calls it Tree Primrose of Virginia. This plant bears its primrose-coloured flowers on branches of three or four feet in height; and hence it was called Tree Primrose, and Evening Primrose, or evening Star, because the flowers burst open and expand in the evening, generally between six and seven o'clock.

We have frequently stood over this plant to watch the expansion of its flowers, the petals of which are confined together by means of the calyx, the ends of which meet over the corolla, and clasp each other by a hook. As the corolla swells in its confinement, the segments of the calyx separate at bottom, and discover the primrose corolla, which appears to be gradually inflating with a gaseous fluid, until it acquires sufficient expansive force to burst the hooks of the calyx. When its petals are thus freed, they expand instantaneously to a cup shape, and in about half an hour after they progressively spread until they become quite flat: by the morning the flowers become flaccid, so that the impregnation must take place after sunset.

The Great-flowered Evening Primrose, *Œnothera grandiflora*, is also a native of North America, and was introduced to our gardens in the year 1778, by John Fothergill, M.D. This species possesses an agreeable fragrance, and hence it is more esteemed than the *biennis*.

These biennial plants are raised by sowing the seeds in autumn, on a border, where the plants should remain until the following autumn, when they may be removed to the situations where they are intended to flower the following summer. In removing them, care is required to avoid breaking the roots, which run deep into the ground. The common kind will grow in almost any soil and situation, but the *grandiflora*, being more delicate, requires a south aspect and a free light earth.

The Sweet-scented or Curl-leaved Evening Primrose, *Œnothera odorata*, is a plant of late introduction, which, from its delightful fragrance and hardy nature, is likely to supersede the other species, so as to banish them from the best gardens. We are indebted to the late Sir Joseph Banks for this species of Œnothera, he having purchased the seeds amongst others, which had been collected by the Surgeon of a merchant-ship, on the coast of Patagonia. The plants were first raised in Europe in 1790.

This proves to be a tolerably hardy perennial plant, growing freely in most situations, and producing plants wherever the seed scatters itself. The stem does not die completely down, even in the open air, and when protected in a conservatory, it becomes an evergreen shrub, singular by its waved foliage, beautiful by its yellow blossoms, delightful for its perfume, and curious because its flowers only open,

When weary peasants, at the close of day,
Walk to their cots, and part upon the way;
When cattle slowly cross the shallow brook,
And shepherds pen their folds, and rest upon their crook.
Crabbe.

[Phillips' *Flora Historica.*]

THE DIVING-BELL.

No. II.

Spalding's Diving-Bell.

We concluded our last article on this subject with a detailed account of Dr. Halley's diving-bell. We now proceed to notice the machines of subsequent improvers, together with some of the important submarine operations performed by means of improved apparatus.

The first improver on Halley's diving-bell was Mr. Triewald, the military architect to the King of Sweden. This bell was on a smaller scale, less expensive, and more easily manageable than Halley's bell. It was adapted for a single diver only. The bell was made of thin copper plate, tinned on the inside and strengthened by bands of iron hoop encompassing it in different directions. It was suspended by a rope from a ring at the top of the bell, and caused to sink perpendicularly by weights suspended from the bottom hoop, as well as by a large iron ring or plate, suspended at such a distance from the bottom of the bell by chains, that when the diver stands upright with his feet upon this plate, his head is above the water in the bell. This situation is better than if his head were in the top part of the bell, the air being cooler and purer near the surface of the water than higher up, because the air which has been breathed is heated, and rises to the top; but when it is necessary for the diver to rise into the top of the bell, means are provided for enabling him to inhale the cool air from the bottom near the water. A spiral copper tube is placed round the inside of the bell, the lower end opening in the bottom of the bell, and the upper end provided with a flexible leather tube ending in an ivory mouth-piece for the diver to hold in his mouth and inspire the air from below; whilst at every expiration he expels the air through his nostrils into the upper part of the bell. This bell may be supplied with fresh air from barrels in the same manner as Dr. Halley's; and is therefore provided with a cock in the top to allow the impure air to escape when a supply of fresh air is obtained. The bell is illuminated by four strong lenses in the top, each provided with copper shutters to defend them from accidents when on shore.

About the year 1776 Mr. Spalding, of Edinburgh, considerably improved the diving-bell, and was rewarded by the Society of Arts for his inventions. Mr. Spalding was practically acquainted with Halley's bell, in an endeavour to recover some of the property of a vessel which had been wrecked on Scares, or as they are also called, the Fern Islands, two years before. This dreadful accident occurred in the night, and all the crew perished. Some of the light goods were thrown on shore, and the heavy and more valuable packages it was thought might be recovered by diving. The surviving owners of the ship intrusted the whole management of the undertaking to Mr. Spalding. His first experimental trials were made in the Leith Roads at depths varying from 5 to 8 fathoms, and, having thus brought his apparatus into working order, he sailed for Dunbar in an open sloop, rigged, of about eight tons' burden. He had been informed that the bottom of the Fox ship of war lay there, but he could get no certain intelligence, since that vessel perished in the night, with all on board, somewhere in Dunbar bay; and by storms, during so long a period as thirty years, was thought to be sanded up. Wishing, before he proceeded to Scares, to make some experimental trials, he descended at a spot where it was probable the Fox lay: but in seven or eight fathoms' water he found only a hard sandy bottom, and no trace of the lost vessel. He made other experimental trials on a vessel sunk at Dundee, and went down three different times, changing the ground each time; and at length fell in with the stump of the wreck, sunk five fathoms deep at low water to a level with the soft bed of the river, which is composed of a light sand intermixed with shells. The chief parts of this wreck were supposed to have been carried away by an immense body of ice the year before. Mr. Spalding found that the muddiness of the river occasions so great a darkness at only two fathoms from the surface, that objects cannot be seen: and from the smallness of his bell, which contained only forty-eight gallons of air, it was impossible to have a candle burning in it, because the flame would vitiate the air too rapidly to enable any man to work, and at the same time to pay attention to receiving the necessary supplies of air.

It will be understood that these trials were only preparatory to the undertaking at Scares, where Mr. Spalding expected to find many dangers and difficulties resulting from a stormy sea and an unequal rocky bottom: but in the above trials, in which the machinery was altered in various ways as experience suggested, so much time had been lost, and the weather became so stormy, that he was obliged to wait at Bamborough Castle some time for favourable weather. He then sailed to Scares with his brother, three sailors and two pilots. It was four o' clock in the afternoon, about high water, when he went down at a small distance from the place where he judged the wreck to lie. The depth was about ten fathoms. He fortunately alighted on a flat part of the rock, near a dreadful chasm, and had gone only two steps with his machine, when the two pilots became so greatly terrified, that in spite of his brother's entreaties, they hoisted up the bell before he had time to examine anything around him. On coming into the boat, the pilots remonstrated on the danger of the machine being overturned either on the wreck or the rocks, and also on the impossibility of raising any of the heavy goods with so small a purchase in an open boat, and in a place, where, at this season, no larger vessel would venture to lie; as the nights were then so long, and only two passages for a small vessel to run through, in case of a gale of easterly or southerly wind,—one of the passages being extremely narrow, and both of them dangerous.

Mr. Spalding, therefore, convinced that with an open boat nothing could be accomplished, and that, except in June and July, no man would risk himself in a sloop for two or three days at anchor in such a place, was compelled to abandon his project; yet he determined to take a view of the guns of a Dutch ship of war, lost in the year 1704; and as they lay two or three miles nearer the land, the project was less difficult, especially as the weather continued favourable. Mr Spalding says:—

> Having procured all the intelligence possible, we went to the place, where I went down four different times, but could find no marks of any wreck, notwithstanding my walking about in five and six fathoms water, as far as it was thought safe to allow the rope to the bell; continuing generally twenty minutes each time at the bottom. On this occasion I was obliged to carry a cutting-hook and knife, and clear away the sea weeds, which at this place are very thick and strong; without this method I could not move about. At the fifth going down, each trial being made in a different place, I was agreeably surprised to find a large grove of tall weeds, all of them from six to eight feet high, with large tufted tops, mostly in regular ranges, as far as the eye could reach,—a variety of small lobsters and other shell-fish swimming about in the intervals.

He then discovered the place where one of the cannons lay; but was too much exhausted, by having

been down at intervals for near three hours, to attempt bringing it up.

In these descents Mr. Spalding discovered two very serious dangers attendant on the use of Dr. Halley's form of diving-bell. *First:* the sinking or rising of the bell depends entirely upon the people who are at the surface of the water; and as the bell, even when in the water, is very heavy, the raising of it requires not only a great deal of labour; but there is the chance of the rope, by which it is raised, breaking; and thus every person in the bell would certainly perish. *Secondly:* in many places of the sea are rocks which lie at a considerable depth, the figure of which cannot be discerned from above. There is danger that some of their rugged prominences may catch hold of one of the edges of the bell in its descent, and thus overturn it, before any signal can be given to those above. Such an accident would be attended with the destruction of the divers, especially as it must always be unknown before trial what kind of a bottom the sea has in any particular spot.

Mr. Spalding therefore made such additions and variations to Halley's bell, as to obviate the above defects. The accompanying figure shows Mr. Spalding's diving-bell. Its body was made of pipe-staves, five feet long, five feet in diameter at the bottom, and two and a half at top. It was suspended by four ropes, affixed to hooks on the sides of the bell, and meeting at the top, where the hook of the great rope takes them. Ballast-weights, suspended from hooks on the outsides serve to keep the mouth of the bell always parallel to the surface of the water. By these weights alone the bell would not sink; another is therefore added, which can be raised or lowered at pleasure, by means of a rope passing over a pulley, and fastened to one of the sides of the bell.

The second objection to Halley's bell,—viz., the chance of the suspending rope breaking, was fully met by the ingenuity of Mr. Spalding. He so contrived that the divers themselves could raise the bell, with all the weights appended to it, to the surface, or remain stationary at any desired depth; so that, even should the suspending rope break, the divers would be safe.

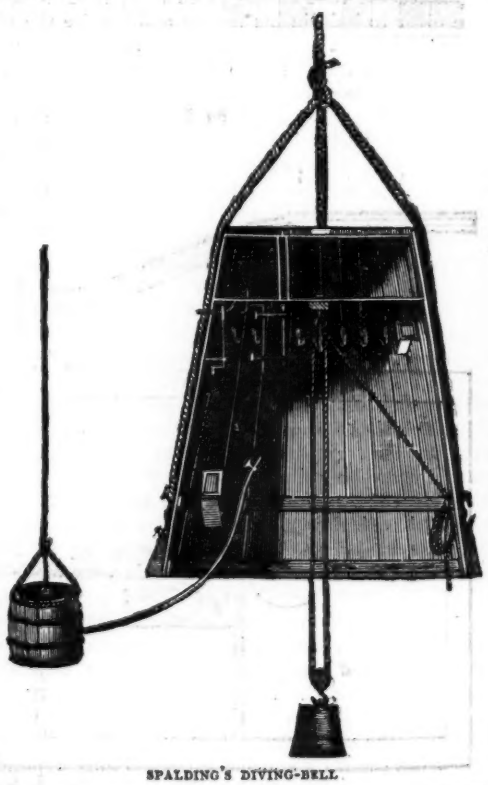
In Mr. Spalding's bell, the divers sit on ropes, instead of wooden seats: the light is admitted through windows of thick strong glass. Fresh air is supplied to the bell by a contrivance similar to that of Halley's, and the hot air is discharged by a small cock, as often as it is found necessary.

The next great improver of the diving-bell is Mr. Smeaton. About the year 1779 he substituted for the air-barrels of Halley, a forcing air-pump, situated above the surface of the water; by means of which a continued stream of air was poured into the bell, along a pipe, without any trouble or attention on the part of the divers. Mr. Smeaton, with his improved apparatus, was the first to introduce the diving-bell into engineering operations, in which it has since rendered such essential service.

Mr. Smeaton did not greatly alter the form of the diving-bell until 1788, when, being employed on some works in Ramsgate-harbour, he introduced an entirely new bell, which is the form of apparatus adopted up to the present day. This bell consisted of a square chest of cast iron, four and a half feet long, of the same height, and three feet wide, capable of holding two men, and cast so thick as to sink by its own weight. The pump for supplying fresh air was placed in a boat by itself, and kept in continual action. This air was conveyed to the bell by a flexible tube, which allowed the bell to be moved up or down, or in any direction independent of the motion of the boat. The bell contained about fifty cubic feet of air, sufficient to support life for two persons for about an hour, independent of any supply from above; so that should any accident happen, there would be time to rescue the divers.

Mr. Smeaton also so arranged the tackling of his diving-bell, as to allow of its being moved about while under water within certain limits. The directions for moving it were given by the divers, and communicated to those above, by striking with a hammer on the inside of the bell. Water conducts sound with great facility, and the blows of a hammer are audible at very considerable distances, and have a peculiar character which prevents their being mistaken for other sounds. The directions of the divers were conveyed by the number of blows previously agreed on. One blow, for instance, denotes "more air:" two, "stand fast:" three, "heave up:" four, "lower down:" and so on.

The construction of Ramsgate harbour, and the constant employment of the diving-bell therein, brought out fully the capabilities of this admirable invention. It would lead us too far, were we to detail the many ingenious plans adopted in the use of the diving-bell in submarine structures. Suffice it to say, that it has been used successfully and extensively in many of the harbours of this and other countries, and that with a safety and precision, which mark the almost perfect state of machines in general; which we may call the children of that prolific mother, necessity—children who pass successively from one foster-father to another, schooled, disciplined, and improved by all, and finally occupying a position among our national resources, which, at its birth, was never anticipated.



SPALDING'S DIVING-BELL.

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